

Innovative Uses of Technology for Measuring Outcomes in Clinical Trials

Panel Comments

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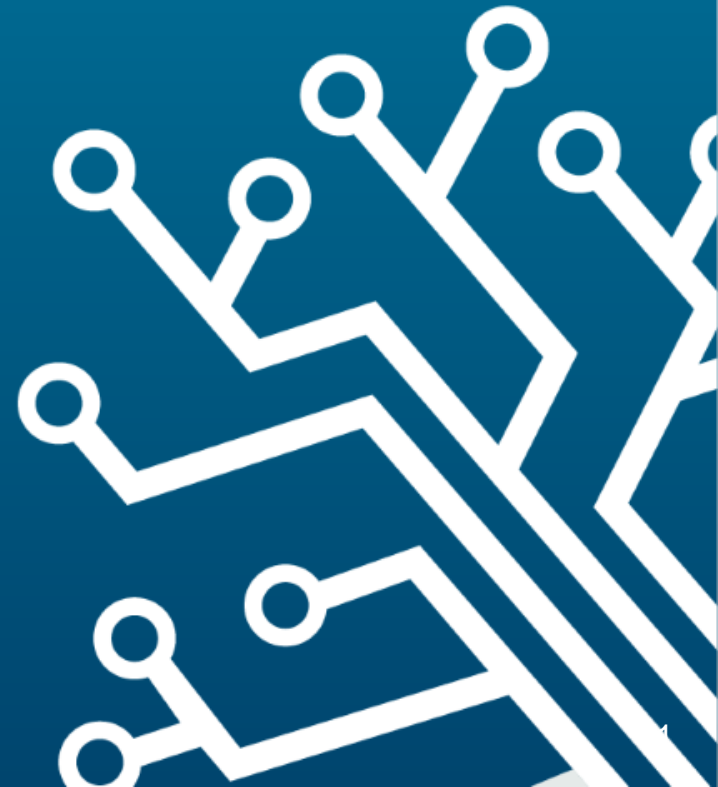
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Background

What are some of the digital biomarker considerations with regards to validation and potential for product labeling?

- Like any measure, basic psychometrics and testing considerations such as
 - **Reliability**
 - **Validity**
 - **Practicality**
- **Data analytics, extraction, and integrity** processes
- Is the device measuring the construct that you think it is measuring?
- Consider translational (does it fit with animal models?)
- Validation and Certification of measures will be necessary for Regulators / Payers
 - EMA could request to issue a qualification opinion and then use your biomarker to enrich a population
 - These surrogate and secondary endpoint measures should be linked with primary or co-primary

Product Labeling Consideration

Potential to replace Phase IV studies with patient centered outcomes (see regulatory / payer considerations above)

- Example-Improves social activity in people with depression



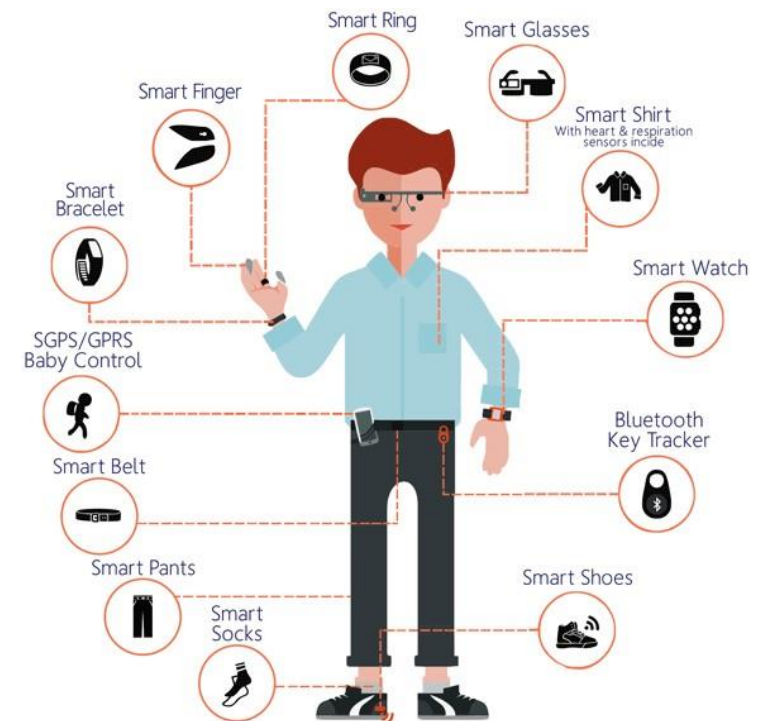
Digital Biomarkers Regulatory Comments (2 of 3)

Regulators and sponsors looking for:

- Better data capture
- Enhanced patient experience (automation)
- Efficient-Data structured for submission
- Real time transparency

Data Challenges

- Data volume-Sponsors not equipped to receive more data from one patient actigraphy than previous **entire** studies
- Continuous data-hard to determine a define variable, or definite endpoint



Digital Biomarkers Regulatory Comments (3 of 3)

- Biometrical subject authentication
- Management of exponential increase in volume of data collected
- Lack of common data standards
- Consumer and even FDA approved devices could be plagued with many
- data reliability issues / missing data
- Retention/adherence issues, subjects neglecting to wear/charge
- Subject Device training and correct use monitoring without overburdening the subject
- Support: Need to make sure solutions don't require the site personnel to
- be "tech people"
- Variability in home environments
- Rate of change in consumertechnology
- Privacy, Legal



Reconciling Big Data and Privacy in Europe

How good faith legal safeguards could *de facto* make Europe non competitive

The new EU General Data Protection Regulation has entered into full force on May 25th, 2018

- Driven by the principle of data minimisation
- Privacy by design and default
- Right to opt out
- Informed consent
- Data ownership – personal / public / private
- Need access to a sufficient amount of “good quality data”

Reconciling Big Data and Privacy in Europe

How good faith legal safeguards could *de facto* make Europe non competitive

The new EU General Data Protection Regulation has entered into full force on May 25th, 2018 but...

- Driven by the principle of data minimization (it will preclude machine learning)
 - Privacy by design and default (it will preclude predictive analytics)
 - Right to opt out (but how?)
 - Informed (really informed?) consent (impossible to predict to what I am giving consent to)
 - Data ownership – personal / public / private (issue is not on ownership but on access)
 - Need access to a sufficient amount of “good quality data” (indeed impossible with limits above)
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- EU Regulators / Payers will have these additional problems
 - Not enough (sometimes none) competence with in-house and hands-on skills
 - Education of new types of assessors with very broad data science and life science knowledge.
 - Inability to certify and validate different data sources to be integrated among them.
 - Rule the emerging strong engagement by patients as datagenerators.



Future insights and issues

New Developments

- Adoption of A.I.
- Machine Learning
- Integration of structured and unstructured data
- Applying an iterative approach
- Use real life certified database for HTA as well

Potential Pitfalls

- Junk in / Junk out
- Missing data
- Unrealistic values
- Not preparing the data for submission or clearly defining the objectives

What we have vs. what is coming

- Sensors for “activity” monitor (ok for now)
- Pattern recognition (pretty cool)
- Human to machine interface (very cool)





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